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BARR

January 4, 2013

Mr. Jason Gunter
Remedial Project Manager
U.S. Environmental Protection Agency
Region 7 - Superfund Branch
901 North 5th Street
Kansas City, KS 66101

Re: The Doe Run Company - Leadwood Mine Tailings Site Monthly Progress Report

Dear Mr. Gunter:

As required by Article VI, Section 50 of the Unilateral Administrative Order (Docket No. CERCLA-07-2006-0272) for the referenced project and on behalf of The Doe Run Company, the progress report for the period October 1, 2012 through October 31, 2012 is enclosed. If you have any questions or comments, please call me at 573-638-5020 or Mark Nations at 573-518-0800.

Sincerely,

Ty L. Morris, P.E., R.G.
Vice President

TLM/jms
Enclosures
c: Mark Nations – TDRC
Matt Wohl – TDRC (electronic only)
Kathy Rangen – MDNR
Tim Skoglund – Barr Engineering

07CR 4.2

OU0D

Leadwood Mine Tailings Site
Leadwood, Missouri
Removal Action - Monthly Progress Report
Period: October 1, 2012 – October 31, 2012

1. **Actions Performed or Completed This Period:**
   a. No activities were completed at the site during this period.
2. **Data and Results Received This Period:**
   a. During this period, water samples were collected from downstream of Leadwood Dam and the East Seep and Erosion Area, as well as from upstream and downstream of the confluence of Eaton Creek with Big River. The analytical results for this event are included with this progress report.
   b. During this period, the Ambient Air Monitoring Report for July 2012 was received. Any issues identified in this report are discussed below. A copy of this document has been sent to your attention.

   The July 2012 Ambient Air Monitoring Report noted the following:
   - The action levels for lead and dust were not exceeded.
   - No samples were taken with the TSP monitors on 07/04/12 due to the holiday.
   - There was a QA blank filter for the Leadwood #3 (School) TSP and PM_{10} monitors on 07/31/12.
3. **Scheduled Activities not Completed This Period:**
   a. None.
4. **Planned Activities for Next Period:**
   a. Continue vegetation maintenance activities. The use of biosolids will only be continued if a biosolids management plan has been submitted to and approved by EPA.
   b. It is anticipated that EPA will use this site as a soil repository in the future. Preparations for these activities will continue.
   c. Complete monthly water sampling activities as described in the Removal Action Work Plan.
   d. Complete air monitoring activities as described in the Removal Action Work Plan.
5. **Changes in Personnel:**
   a. None.
6. **Issues or Problems Arising This Period:**
   a. None.
7. **Resolution of Issues or Problems Arising This Period:**
   a. None.

End of Monthly Progress Report

November 02, 2012

Allison Olds
Barr Engineering Company
1001 Diamond Ridge
Suite 1100
Jefferson City, MO 65109
TEL: (573) 638-5007
FAX: (573) 638-5001

RE: Leadwood MTS-25/86-0013 **WorkOrder:** 12100835

Dear Allison Olds:

TEKLAB, INC received 5 samples on 10/17/2012 10:00:00 AM for the analysis presented in the following report.

Samples are analyzed on an as received basis unless otherwise requested and documented. The sample results contained in this report relate only to the requested analytes of interest as directed on the chain of custody. NELAP accredited fields of testing are indicated by the letters NELAP under the Certification column. Unless otherwise documented within this report, Teklab Inc. analyzes samples utilizing the most current methods in compliance with 40CFR. All tests are performed in the Collinsville, IL laboratory unless otherwise noted in the Case Narrative.

All quality control criteria applicable to the test methods employed for this project have been satisfactorily met and are in accordance with NELAP except where noted. The following report shall not be reproduced, except in full, without the written approval of Teklab, Inc.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Michael L. Austin
Project Manager
(618)344-1004 ex 16
MAustin@teklabinc.com

Client: Barr Engineering Company
Client Project: Leadwood MTS-25/86-0013

Work Order: 12100835
Report Date: 02-Nov-12

This reporting package includes the following:

Cover Letter	1
Report Contents	2
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Chain of Custody	Appended

Client: Barr Engineering Company
Work Order: 12100835
Client Project: Leadwood MTS-25/86-0013
Report Date: 02-Nov-12

Abbr Definition

Abbr	Definition
CCV	Continuing calibration verification is a check of a standard to determine the state of calibration of an instrument between recalibration.
DF	Dilution factor is the dilution performed during analysis only and does not take into account any dilutions made during sample preparation. The reported result is final and includes all dilutions factors.
DNI	Did not ignite
DUP	Laboratory duplicate is an aliquot of a sample taken from the same container under laboratory conditions for independent processing and analysis independently of the original aliquot.
ICV	Initial calibration verification is a check of a standard to determine the state of calibration of an instrument before sample analysis is initiated.
IDPH	IL Dept. of Public Health
LCS	Laboratory control sample, spiked with verified known amounts of analytes, is analyzed exactly like a sample to establish intra-laboratory or analyst specific precision and bias or to assess the performance of all or a portion of the measurement system. The acceptable recovery range is in the QC Package (provided upon request).
LCSD	Laboratory control sample duplicate is a replicate laboratory control sample that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
MB	Method blank is a sample of a matrix similar to the batch of associated sample (when available) that is free from the analytes of interest and is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedures, and in which no target analytes or interferences should present at concentrations that impact the analytical results for sample analyses.
MDL	Method detection limit means the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.
MS	Matrix spike is an aliquot of matrix fortified (spiked) with known quantities of specific analytes that is subjected to the entire analytical procedures in order to determine the effect of the matrix on an approved test method's recovery system. The acceptable recovery range is listed in the QC Package (provided upon request).
MSD	Matrix spike duplicate means a replicate matrix spike that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
MW	Molecular weight
ND	Not Detected at the Reporting Limit
NELAP	NELAP Accredited
PQL	Practical quantitation limit means the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operation conditions. The acceptable recovery range is listed in the QC Package (provided upon request).
RL	The reporting limit the lowest level that the data is displayed in the final report. The reporting limit may vary according to customer request or sample dilution. The reporting limit may not be less than the MDL.
RPD	Relative percent difference is a calculated difference between two recoveries (ie. MS/MSD). The acceptable recovery limit is listed in the QC Package (provided upon request).
SPK	The spike is a known mass of target analyte added to a blank sample or sub-sample; used to determine recovery deficiency or for other quality control purposes.
Surr	Surrogates are compounds which are similar to the analytes of interest in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples.
TNTC	Too numerous to count (> 200 CFU)

Qualifiers

- # - Unknown hydrocarbon
- B - Analyte detected in associated Method Blank
- E - Value above quantitation range
- H - Holding times exceeded
- M - Manual Integration used to determine area response
- ND - Not Detected at the Reporting Limit
- R - RPD outside accepted recovery limits
- S - Spike Recovery outside recovery limits
- X - Value exceeds Maximum Contaminant Level

Client: Barr Engineering Company
Client Project: Leadwood MTS-25/86-0013

Work Order: 12100835
Report Date: 02-Nov-12

Cooler Receipt Temp: 1.4 °C

This report was revised on 11/02/2012 per Terri Olson's request. The reason for the revision is add the Method Blank and LCS to the QC report for Zinc. Please replace report dated 10/22/2012 with this report. MLA 11/02/12

Locations and Accreditations

Collinsville		Springfield		Kansas City	
Address	5445 Horseshoe Lake Road Collinsville, IL 62234-7425	Address	3920 Pintail Dr Springfield, IL 62711-9415	Address	8421 Nieman Road Lenexa, KS 66214
Phone	(618) 344-1004	Phone	(217) 698-1004	Phone	(913) 541-1998
Fax	(618) 344-1005	Fax	(217) 698-1005	Fax	(913) 541-1998
Email	jhriley@teklabinc.com	Email	kmcclain@teklabinc.com	Email	dthompson@teklabinc.com

State	Dept	Cert #	NELAP	Exp Date	Lab
Illinois	IEPA	100226	NELAP	1/31/2013	Collinsville
Kansas	KDHE	E-10374	NELAP	1/31/2013	Collinsville
Louisiana	LDEQ	166493	NELAP	6/30/2013	Collinsville
Louisiana	LDEQ	166578	NELAP	6/30/2013	Springfield
Texas	TCEQ	T104704515-12-1	NELAP	7/31/2013	Collinsville
Arkansas	ADEQ	88-0966		3/14/2013	Collinsville
Illinois	IDPH	17584		4/30/2013	Collinsville
Kentucky	UST	0073		5/26/2013	Collinsville
Missouri	MDNR	00930		4/13/2013	Collinsville
Oklahoma	ODEQ	9978		8/31/2013	Collinsville

Client: Barr Engineering Company
Work Order: 12100835
Client Project: Leadwood MTS-25/86-0013
Report Date: 02-Nov-12
Lab ID: 12100835-001
Client Sample ID: LW-001
Matrix: WASTE WATER
Collection Date: 10/16/2012 8:45

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 375.2 REV 2.0 1993 (TOTAL)								
Sulfate	NELAP	200		**766**	mg/L	20	10/18/2012 3:26	R169463
STANDARD METHOD 4500-H B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**7.99**		1	10/17/2012 14:16	R169403
STANDARD METHODS 2340 C								
Hardness, as (CaCO3)	NELAP	5		**920**	mg/L	1	10/18/2012 7:50	R169407
STANDARD METHODS 2540 D								
Total Suspended Solids	NELAP	6		**< 6**	mg/L	1	10/18/2012 9:43	R169470
STANDARD METHODS 2540 F								
Solids, Settleable	NELAP	0.1		**< 0.1**	ml/L	1	10/17/2012 13:47	R169428
STANDARD METHODS 5310 C, ORGANIC CARBON								
Total Organic Carbon (TOC)	NELAP	1.0		**4.9**	mg/L	1	10/18/2012 15:43	R169504
EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)								
Cadmium	NELAP	2.00		**2.60**	µg/L	1	10/18/2012 12:52	82578
Zinc	NELAP	10.0		**1060**	µg/L	1	10/18/2012 12:52	82578
EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)								
Cadmium	NELAP	2.00		**2.90**	µg/L	1	10/18/2012 13:54	82577
Zinc	NELAP	10.0		**1130**	µg/L	1	10/18/2012 13:54	82577
STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA								
Lead	NELAP	4.00	X	**27.2**	µg/L	2	10/18/2012 11:58	82570
STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)								
Lead	NELAP	2.00	X	**15.8**	µg/L	1	10/18/2012 14:05	82567

Client: Barr Engineering Company
Work Order: 12100835
Client Project: Leadwood MTS-25/86-0013
Report Date: 02-Nov-12
Lab ID: 12100835-002
Client Sample ID: LW-002
Matrix: WASTE WATER
Collection Date: 10/16/2012 9:55

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 375.2 REV 2.0 1993 (TOTAL)								
Sulfate	NELAP	500		**519**	mg/L	50	10/18/2012 3:28	R169463
STANDARD METHOD 4500-H B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**7.92**		1	10/17/2012 14:18	R169403
STANDARD METHODS 2340 C								
Hardness, as (CaCO3)	NELAP	5		**620**	mg/L	1	10/18/2012 7:50	R169407
STANDARD METHODS 2540 D								
Total Suspended Solids	NELAP	6		**< 6**	mg/L	1	10/18/2012 9:43	R169470
STANDARD METHODS 2540 F								
Solids, Settleable	NELAP	0.1		**< 0.1**	ml/L	1	10/17/2012 13:47	R169428
STANDARD METHODS 5310 C, ORGANIC CARBON								
Total Organic Carbon (TOC)	NELAP	1.0		**1.6**	mg/L	1	10/18/2012 15:49	R169504
EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)								
Cadmium	NELAP	2.00		**< 2.00**	µg/L	1	10/18/2012 13:03	82578
Zinc	NELAP	10.0		**2810**	µg/L	1	10/18/2012 13:03	82578
EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)								
Cadmium	NELAP	2.00		**< 2.00**	µg/L	1	10/18/2012 16:27	82577
Zinc	NELAP	10.0		**3080**	µg/L	1	10/18/2012 16:27	82577
STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA								
Lead	NELAP	10.0	X	**24.7**	µg/L	5	10/18/2012 15:50	82570
STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)								
Lead	NELAP	10.0	X	**15.6**	µg/L	5	10/18/2012 16:03	82567

Client: Barr Engineering Company
Work Order: 12100835
Client Project: Leadwood MTS-25/86-0013
Report Date: 02-Nov-12
Lab ID: 12100835-003
Client Sample ID: LW-Dup
Matrix: WASTE WATER
Collection Date: 10/16/2012 10:40

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 375.2 REV 2.0 1993 (TOTAL)								
Sulfate	NELAP	10		**20**	mg/L	1	10/19/2012 13:25	R169547
STANDARD METHOD 4500-H B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**7.80**		1	10/17/2012 14:21	R169403
STANDARD METHODS 2340 C								
Hardness, as (CaCO3)	NELAP	5		**220**	mg/L	1	10/18/2012 7:50	R169407
STANDARD METHODS 2540 D								
Total Suspended Solids	NELAP	6		**< 6**	mg/L	1	10/18/2012 9:43	R169470
STANDARD METHODS 5310 C, ORGANIC CARBON								
Total Organic Carbon (TOC)	NELAP	1.0		**4.6**	mg/L	1	10/18/2012 15:56	R169504
EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)								
Cadmium	NELAP	2.00		**< 2.00**	µg/L	1	10/18/2012 13:07	82578
Zinc	NELAP	10.0		**< 10.0**	µg/L	1	10/18/2012 13:07	82578
EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)								
Cadmium	NELAP	2.00		**< 2.00**	µg/L	1	10/18/2012 16:31	82577
Zinc	NELAP	10.0		**12.3**	µg/L	1	10/18/2012 16:31	82577
STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA								
Lead	NELAP	2.00		**< 2.00**	µg/L	1	10/18/2012 12:23	82570
STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)								
Lead	NELAP	2.00		**< 2.00**	µg/L	1	10/18/2012 14:25	82567

Client: Barr Engineering Company
Work Order: 12100835
Client Project: Leadwood MTS-25/86-0013
Report Date: 02-Nov-12
Lab ID: 12100835-004
Client Sample ID: LW-US
Matrix: WASTE WATER
Collection Date: 10/16/2012 8:20

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 375.2 REV 2.0 1993 (TOTAL)								
Sulfate	NELAP	10		**14**	mg/L	1	10/18/2012 3:50	R169463
STANDARD METHOD 4500-H B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**7.74**		1	10/17/2012 14:22	R169403
STANDARD METHODS 2340 C								
Hardness, as (CaCO3)	NELAP	5		**200**	mg/L	1	10/18/2012 7:50	R169407
STANDARD METHODS 2540 D								
Total Suspended Solids	NELAP	6		**< 6**	mg/L	1	10/18/2012 9:56	R169470
STANDARD METHODS 5310 C, ORGANIC CARBON								
Total Organic Carbon (TOC)	NELAP	1.0		**4.4**	mg/L	1	10/18/2012 16:02	R169504
EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)								
Cadmium	NELAP	2.00		**< 2.00**	µg/L	1	10/18/2012 13:21	82578
Zinc	NELAP	10.0		**< 10.0**	µg/L	1	10/18/2012 13:21	82578
EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)								
Cadmium	NELAP	2.00		**< 2.00**	µg/L	1	10/18/2012 16:34	82577
Zinc	NELAP	10.0		**< 10.0**	µg/L	1	10/18/2012 16:34	82577
STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA								
Lead	NELAP	2.00		**< 2.00**	µg/L	1	10/18/2012 12:26	82570
STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)								
Lead	NELAP	2.00		**< 2.00**	µg/L	1	10/18/2012 14:28	82567

Client: Barr Engineering Company
Work Order: 12100835
Client Project: Leadwood MTS-25/86-0013
Report Date: 02-Nov-12
Lab ID: 12100835-005
Client Sample ID: LW-DS
Matrix: WASTE WATER
Collection Date: 10/16/2012 10:35

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 375.2 REV 2.0 1993 (TOTAL)								
Sulfate	NELAP	10		**17**	mg/L	1	10/18/2012 4:00	R169463
STANDARD METHOD 4500-H B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**7.74**		1	10/17/2012 14:24	R169403
STANDARD METHODS 2340 C								
Hardness, as (CaCO3)	NELAP	5		**200**	mg/L	1	10/18/2012 7:50	R169407
STANDARD METHODS 2540 D								
Total Suspended Solids	NELAP	6		**< 6**	mg/L	1	10/18/2012 9:56	R169470
STANDARD METHODS 5310 C, ORGANIC CARBON								
Total Organic Carbon (TOC)	NELAP	1.0		**4.6**	mg/L	1	10/18/2012 16:08	R169504
EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)								
Cadmium	NELAP	2.00		**< 2.00**	µg/L	1	10/18/2012 13:25	82578
Zinc	NELAP	10.0		**< 10.0**	µg/L	1	10/18/2012 13:25	82578
EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)								
Cadmium	NELAP	2.00		**< 2.00**	µg/L	1	10/18/2012 16:38	82577
Zinc	NELAP	10.0		**10.3**	µg/L	1	10/18/2012 16:38	82577
STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA								
Lead	NELAP	2.00		**< 2.00**	µg/L	1	10/18/2012 12:30	82570
STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)								
Lead	NELAP	2.00		**< 2.00**	µg/L	1	10/18/2012 14:32	82567

Client: Barr Engineering Company
Client Project: Leadwood MTS-25/86-0013

Work Order: 12100835
Report Date: 02-Nov-12

Lab Sample ID	Client Sample ID	Matrix	Fractions	Collection Date
12100835-001	LW-001	Waste Water	5	10/16/2012 8:45
12100835-002	LW-002	Waste Water	5	10/16/2012 9:55
12100835-003	LW-Dup	Waste Water	5	10/16/2012 10:40
12100835-004	LW-US	Waste Water	5	10/16/2012 8:20
12100835-005	LW-DS	Waste Water	5	10/16/2012 10:35

Client: Barr Engineering Company
Client Project: Leadwood MTS-25/86-0013

Work Order: 12100835
Report Date: 02-Nov-12

Sample ID	Client Sample ID / Test Name	Collection Date	Received Date	Prep Date/Time	Analysis Date/Time
12100835-001A	LW-001	10/16/2012 8:45	10/17/2012 10:00		
	Standard Methods 2540 F				10/17/2012 13:47
12100835-001B	LW-001	10/16/2012 8:45	10/17/2012 10:00		
	EPA 600 375.2 Rev 2.0 1993 (Total)				10/18/2012 3:26
	Standard Method 4500-H B, Laboratory Analyzed				10/17/2012 14:16
	Standard Methods 2340 C				10/18/2012 7:50
	Standard Methods 2540 D				10/18/2012 9:43
12100835-001C	LW-001	10/16/2012 8:45	10/17/2012 10:00		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)			10/17/2012 15:59	10/18/2012 13:54
	Standard Methods 3030 E, 3113 B, Metals by GFAA			10/17/2012 14:50	10/18/2012 11:58
12100835-001D	LW-001	10/16/2012 8:45	10/17/2012 10:00		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)			10/17/2012 16:36	10/18/2012 12:52
	Standard Methods 3030 B, 3113 B, Metals by GFAA (Dissolved)			10/17/2012 14:09	10/18/2012 14:05
12100835-001E	LW-001	10/16/2012 8:45	10/17/2012 10:00		
	Standard Methods 5310 C, Organic Carbon				10/18/2012 15:43
12100835-002A	LW-002	10/16/2012 9:55	10/17/2012 10:00		
	Standard Methods 2540 F				10/17/2012 13:47
12100835-002B	LW-002	10/16/2012 9:55	10/17/2012 10:00		
	EPA 600 375.2 Rev 2.0 1993 (Total)				10/18/2012 3:28
	Standard Method 4500-H B, Laboratory Analyzed				10/17/2012 14:18
	Standard Methods 2340 C				10/18/2012 7:50
	Standard Methods 2540 D				10/18/2012 9:43
12100835-002C	LW-002	10/16/2012 9:55	10/17/2012 10:00		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)			10/17/2012 15:59	10/18/2012 16:27
	Standard Methods 3030 E, 3113 B, Metals by GFAA			10/17/2012 14:50	10/18/2012 15:50
12100835-002D	LW-002	10/16/2012 9:55	10/17/2012 10:00		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)			10/17/2012 16:36	10/18/2012 13:03
	Standard Methods 3030 B, 3113 B, Metals by GFAA (Dissolved)			10/17/2012 14:09	10/18/2012 16:03
12100835-002E	LW-002	10/16/2012 9:55	10/17/2012 10:00		
	Standard Methods 5310 C, Organic Carbon				10/18/2012 15:49
12100835-003A	LW-Dup	10/16/2012 10:40	10/17/2012 10:00		
	Standard Methods 2340 C				10/18/2012 7:50
	Standard Methods 2540 D				10/18/2012 9:43
12100835-003B	LW-Dup	10/16/2012 10:40	10/17/2012 10:00		
	EPA 600 375.2 Rev 2.0 1993 (Total)				10/19/2012 13:25
	Standard Method 4500-H B, Laboratory Analyzed				10/17/2012 14:21

Client: Barr Engineering Company
Client Project: Leadwood MTS-25/86-0013

Work Order: 12100835
Report Date: 02-Nov-12

Sample ID	Client Sample ID / Test Name	Collection Date	Received Date	Prep Date/Time	Analysis Date/Time
12100835-003C	LW-Dup	10/16/2012 10:40	10/17/2012 10:00		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)			10/17/2012 15:59	10/18/2012 16:31
	Standard Methods 3030 E, 3113 B, Metals by GFAA			10/17/2012 14:50	10/18/2012 12:23
12100835-003D	LW-Dup	10/16/2012 10:40	10/17/2012 10:00		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)			10/17/2012 16:36	10/18/2012 13:07
	Standard Methods 3030 B, 3113 B, Metals by GFAA (Dissolved)			10/17/2012 14:09	10/18/2012 14:25
12100835-003E	LW-Dup	10/16/2012 10:40	10/17/2012 10:00		
	Standard Methods 5310 C, Organic Carbon				10/18/2012 15:56
12100835-004A	LW-US	10/16/2012 8:20	10/17/2012 10:00		
	Standard Methods 2340 C				10/18/2012 7:50
	Standard Methods 2540 D				10/18/2012 9:56
12100835-004B	LW-US	10/16/2012 8:20	10/17/2012 10:00		
	EPA 600 375.2 Rev 2.0 1993 (Total)				10/18/2012 3:50
	Standard Method 4500-H B, Laboratory Analyzed				10/17/2012 14:22
12100835-004C	LW-US	10/16/2012 8:20	10/17/2012 10:00		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)			10/17/2012 15:59	10/18/2012 16:34
	Standard Methods 3030 E, 3113 B, Metals by GFAA			10/17/2012 14:50	10/18/2012 12:26
12100835-004D	LW-US	10/16/2012 8:20	10/17/2012 10:00		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)			10/17/2012 16:36	10/18/2012 13:21
	Standard Methods 3030 B, 3113 B, Metals by GFAA (Dissolved)			10/17/2012 14:09	10/18/2012 14:28
12100835-004E	LW-US	10/16/2012 8:20	10/17/2012 10:00		
	Standard Methods 5310 C, Organic Carbon				10/18/2012 16:02
12100835-005A	LW-DS	10/16/2012 10:35	10/17/2012 10:00		
	Standard Methods 2340 C				10/18/2012 7:50
	Standard Methods 2540 D				10/18/2012 9:56
12100835-005B	LW-DS	10/16/2012 10:35	10/17/2012 10:00		
	EPA 600 375.2 Rev 2.0 1993 (Total)				10/18/2012 4:00
	Standard Method 4500-H B, Laboratory Analyzed				10/17/2012 14:24
12100835-005C	LW-DS	10/16/2012 10:35	10/17/2012 10:00		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)			10/17/2012 15:59	10/18/2012 16:38
	Standard Methods 3030 E, 3113 B, Metals by GFAA			10/17/2012 14:50	10/18/2012 12:30
12100835-005D	LW-DS	10/16/2012 10:35	10/17/2012 10:00		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)			10/17/2012 16:36	10/18/2012 13:25
	Standard Methods 3030 B, 3113 B, Metals by GFAA (Dissolved)			10/17/2012 14:09	10/18/2012 14:32
12100835-005E	LW-DS	10/16/2012 10:35	10/17/2012 10:00		
	Standard Methods 5310 C, Organic Carbon				10/18/2012 16:08

Client: Barr Engineering Company
Client Project: Leadwood MTS-25/86-0013

Work Order: 12100835
Report Date: 02-Nov-12

EPA 600 375.2 REV 2.0 1993 (TOTAL)

Batch R169463 **SampType:** MBLK Units mg/L
SampID: MBLK

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	10		< 10						10/17/2012

Batch R169463 **SampType:** LCS Units mg/L
SampID: LCS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	10		22	20	0	109.2	90	110	10/17/2012

Batch R169463 **SampType:** MS Units mg/L
SampID: 12100835-004BMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	10		23	10	13.65	94.5	90	110	10/18/2012

Batch R169463 **SampType:** MSD Units mg/L RPD Limit 10
SampID: 12100835-004BMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Sulfate	10		23	10	13.65	94.2	23.10	0.13	10/18/2012

Batch R169508 **SampType:** MBLK Units mg/L
SampID: MBLK

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	10		< 10						10/18/2012

Batch R169508 **SampType:** LCS Units mg/L
SampID: LCS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	10		21	20	0	103.0	90	110	10/18/2012

Batch R169547 **SampType:** MBLK Units mg/L
SampID: MBLK

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	10		< 10						10/19/2012

Batch R169547 **SampType:** LCS Units mg/L
SampID: LCS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	10		20	20	0	102.1	90	110	10/19/2012

Client: Barr Engineering Company
Client Project: Leadwood MTS-25/86-0013

Work Order: 12100835
Report Date: 02-Nov-12

STANDARD METHOD 4500-H B, LABORATORY ANALYZED

Batch R169403 **SampType:** LCS Units
SampID: LCS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lab pH	1.00		**6.98**	7.00	0	99.7	99.1	100.8	10/17/2012

Batch R169403 **SampType:** DUP Units RPD Limit **10**
SampID: 12100835-001BDUP

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH	1.00		**8.00**				7.990	0.13	10/17/2012

Batch R169403 **SampType:** DUP Units RPD Limit **10**
SampID: 12100835-002BDUP

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH	1.00		**7.92**				7.920	0.00	10/17/2012

Batch R169403 **SampType:** DUP Units RPD Limit **10**
SampID: 12100835-003BDUP

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH	1.00		**7.78**				7.800	0.26	10/17/2012

Batch R169403 **SampType:** DUP Units RPD Limit **10**
SampID: 12100835-004BDUP

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH	1.00		**7.75**				7.740	0.13	10/17/2012

Batch R169403 **SampType:** DUP Units RPD Limit **10**
SampID: 12100835-005BDUP

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH	1.00		**7.74**				7.740	0.00	10/17/2012

STANDARD METHODS 2340 C

Batch R169407 **SampType:** MBLK Units **mg/L**
SampID: MB-R169407

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Hardness, as (CaCO3)	5		**< 5**						10/17/2012

Batch R169407 **SampType:** LCS Units **mg/L**
SampID: LCS-R169407

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Hardness, as (CaCO3)	5		**980**	1000	0	98.0	90	110	10/17/2012

Client: Barr Engineering Company **Work Order:** 12100835

Client Project: Leadwood MTS-25/86-0013 **Report Date:** 02-Nov-12

STANDARD METHODS 2340 C

Batch R169407 **SampType:** MS Units mg/L

SampID: 12100835-005AMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Hardness, as (CaCO3)	5		**600**	400	200.0	100.0	85	115	10/18/2012

Batch R169407 **SampType:** MSD Units mg/L RPD Limit 10

SampID: 12100835-005AMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Hardness, as (CaCO3)	5		**620**	400	200.0	105.0	600.0	3.28	10/18/2012

STANDARD METHODS 2540 D

Batch R169470 **SampType:** MBLK Units mg/L

SampID: MBLK

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Suspended Solids	6		**< 6**						10/18/2012

Batch R169470 **SampType:** LCS Units mg/L

SampID: LCS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Suspended Solids	6		**90**	100	0	90.0	85	115	10/18/2012
Total Suspended Solids	6		**104**	100	0	104.0	85	115	10/18/2012
Total Suspended Solids	6		**101**	100	0	101.0	85	115	10/18/2012
Total Suspended Solids	6		**93**	100	0	93.0	85	115	10/18/2012

Batch R169470 **SampType:** DUP Units mg/L RPD Limit 15

SampID: 12100835-003A DUP

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Total Suspended Solids	6		**< 6**				0	0.00	10/18/2012

STANDARD METHODS 5310 C, ORGANIC CARBON

Batch R169504 **SampType:** MBLK Units mg/L

SampID: MBLK

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Organic Carbon (TOC)	1.0		**< 1.0**						10/18/2012

Batch R169504 **SampType:** LCS Units mg/L

SampID: LCS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Organic Carbon (TOC)	10.0		**59.9**	59.7	0	100.4	90	110	10/18/2012

Batch R169504 **SampType:** MS Units mg/L

SampID: 12100835-005EMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Organic Carbon (TOC)	1.0		**9.4**	5.0	4.560	97.6	85	115	10/18/2012

Client: Barr Engineering Company

Client Project: Leadwood MTS-25/86-0013

Work Order: 12100835

Report Date: 02-Nov-12

STANDARD METHODS 5310 C, ORGANIC CARBON

Batch R169504 **SampType:** MSD Units **mg/L** RPD Limit **10**

SampID: 12100835-005EMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Total Organic Carbon (TOC)	1.0		**9.5**	5.0	4.560	98.6	9.440	0.53	10/18/2012

EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)

Batch 82578 **SampType:** MBLK Units **µg/L**

SampID: MB-82578

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Cadmium	2.00		**< 2.00**	2.00	0	0	-100	100	10/18/2012
Zinc	10.0		**< 10.0**	10.0	0	0	-100	100	10/18/2012

Batch 82578 **SampType:** LCS Units **µg/L**

SampID: LCS-82578

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Cadmium	2.00		**46.8**	50.0	0	93.6	85	115	10/18/2012
Zinc	10.0		**499**	500	0	99.9	85	115	10/18/2012

Batch 82578 **SampType:** MS Units **µg/L**

SampID: 12100835-001DMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Cadmium	2.00		**48.4**	50.0	2.6	91.6	75	125	10/18/2012
Zinc	10.0		**1520**	500	1059	91.2	75	125	10/18/2012

Batch 82578 **SampType:** MSD Units **µg/L** RPD Limit **20**

SampID: 12100835-001DMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Cadmium	2.00		**48.6**	50.0	2.6	92.0	48.4	0.41	10/18/2012
Zinc	10.0		**1520**	500	1059	91.4	1515	0.07	10/18/2012

EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)

Batch 82577 **SampType:** MBLK Units **µg/L**

SampID: MB-82577

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Cadmium	2.00		**< 2.00**	2.00	0	0	-100	100	10/18/2012
Zinc	10.0		**< 10.0**	10.0	0	0	-100	100	10/18/2012

Batch 82577 **SampType:** LCS Units **µg/L**

SampID: LCS-82577

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Cadmium	2.00		**50.9**	50.0	0	101.8	85	115	10/18/2012
Zinc	10.0		**538**	500	0	107.6	85	115	10/18/2012

Client: Barr Engineering Company **Work Order:** 12100835

Client Project: Leadwood MTS-25/86-0013 **Report Date:** 02-Nov-12

EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)

Batch 82577 **SampType:** MS Units µg/L

SampID: 12100835-001CMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Cadmium	2.00		**52.6**	50.0	2.9	99.4	75	125	10/18/2012
Zinc	10.0		**1640**	500	1133	102.0	75	125	10/18/2012

Batch 82577 **SampType:** MSD Units µg/L RPD Limit **20**

SampID: 12100835-001CMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Cadmium	2.00		**52.3**	50.0	2.9	98.8	52.6	0.57	10/18/2012
Zinc	10.0		**1660**	500	1133	106.2	1643	1.27	10/18/2012

STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA

Batch 82570 **SampType:** MBLK Units µg/L

SampID: MB-82570

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead	2.00		**< 2.00**	2.00	0	0	-100	100	10/18/2012

Batch 82570 **SampType:** LCS Units µg/L

SampID: LCS-82570

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead	2.00		**13.4**	15.0	0	89.0	85	115	10/18/2012

Batch 82570 **SampType:** MS Units µg/L

SampID: 12100835-002CMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead	10.0		**38.4**	15.0	24.705	91.0	70	130	10/18/2012

Batch 82570 **SampType:** MSD Units µg/L RPD Limit **20**

SampID: 12100835-002CMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lead	10.0		**38.4**	15.0	24.705	91.0	38.3595	0.00	10/18/2012

STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)

Batch 82567 **SampType:** MBLK Units µg/L

SampID: MB-82567

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead	2.00		**< 2.00**	2.00	0	0	-100	100	10/18/2012

Batch 82567 **SampType:** LCS Units µg/L

SampID: LCS-82567

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead	2.00		**13.9**	15.0	0	92.9	85	115	10/18/2012

Client: Barr Engineering Company

Client Project: Leadwood MTS-25/86-0013

Work Order: 12100835

Report Date: 02-Nov-12

STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)

Batch 82567 **SampType:** MS Units µg/L

SampID: 12100835-002DMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead	10.0		**30.3**	15.0	15.5875	98.3	70	130	10/18/2012

Batch 82567 **SampType:** MSD Units µg/L RPD Limit **20**

SampID: 12100835-002DMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lead	10.0		**29.6**	15.0	15.5875	93.5	30.3295	2.41	10/18/2012

Teklab, Inc.
Environmental Laboratory

Receiving Check List

http://www.teklabinc.com/

Client: Barr Engineering Company
Client Project: Leadwood MTS-25/86-0013

Work Order: 12100835
Report Date: 02-Nov-12

Carrier: Rick Schmidt

Received By: TWM

Completed by: Timothy W. Mathis
On: 17-Oct-12

Reviewed by: Michael L. Austin
On: 17-Oct-12

Pages to follow: Chain of custody [1] Extra pages included [0]

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐		Temp °C	1.4	
Type of thermal preservation?	None ☐	Ice ☑	Blue Ice ☐		Dry Ice	☐	
Chain of custody present?	Yes ☑	No ☐					
Chain of custody signed when relinquished and received?	Yes ☑	No ☐					
Chain of custody agrees with sample labels?	Yes ☑	No ☐					
Samples in proper container/bottle?	Yes ☑	No ☐					
Sample containers intact?	Yes ☑	No ☐					
Sufficient sample volume for indicated test?	Yes ☑	No ☐					
All samples received within holding time?	Yes ☑	No ☐					
Reported field parameters measured:	Field ☐	Lab ☐	NA ☑				
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐					
When thermal preservation is required, samples are compliant with a temperature between 0.1°C - 6.0°C, or when samples are received on ice the same day as collected.							
Water – at least one vial per sample has zero headspace?	Yes ☐	No ☐	No VOA vials ☑				
Water - TOX containers have zero headspace?	Yes ☐	No ☐	No TOX containers ☑				
Water - pH acceptable upon receipt?	Yes ☑	No ☐					
NPDES/CWA TCN interferences checked/treated in the field?	Yes ☐	No ☐	NA ☑				

Any No responses must be detailed below or on the COC.

Custody seal(s) intact on shipping container/cooler.

Print Form

Teklab Chain of Custody

Pg. 1 of 1 Workorder 12100835

5445 Horseshoe Lake Road ~ Collinsville, IL 62234 ~ Phone: (618)344-1004 ~ Fax:(618)344-1005

Barr Engineering Co.

1001 Diamond Ridge, Suite 1100

Jefferson City | MO | 65109

Leadwood MTS - 25/86-0013

Are the samples chilled? (•) Yes ( ) No with: (•) Ice ( ) Blue ice Preserved in (•) Lab ( ) Field

Cooler Temp 1.4 Sampler SBM

TM 10:17 12

Comments: Invoice to Mark Nations. Results to Allison Olds and Mark Nations, mnations@doerun.com. Matrix is surface water. Metals: Cd, Pb, Zn custody seal intact upon pick up

Contact Allison Olds eMail aolds@barr.com Phone 573-638-5007 Requested Due Date Standard Billing/PO Per contract with Doe Run

Lab Use	Sample ID	Sample Date/Time	Preservative	Matrix	pH (2)	T.S.S. (1)	Sulfate (2)	Settleable Solids	T.O.C.	Total Metals	Dissolved Metals	Hardness (1)				
12100835 -001	LW-001	10-16-12 08:45	Unpres	Aqueous	☒	☒	☒	☒	☒	☒	☒	☒	☐	☐	☐	☐
-002	LW-002	10-16-12 09:55	Unpres	Aqueous	☒	☒	☒	☒	☒	☒	☒	☒	☐	☐	☐	☐
-003	LW-Dup	10-16-12 10:40	Unpres	Aqueous	☒	☒	☒	☐	☒	☒	☒	☒	☐	☐	☐	☐
-004	LW-US	10-16-12 08:20	Unpres	Aqueous	☒	☒	☒	☐	☒	☒	☒	☒	☐	☐	☐	☐
-005	LW-DS	10-16-12 10:35	Unpres	Aqueous	☒	☒	☒	☐	☒	☒	☒	☒	☐	☐	☐	☐
			Unpres	Aqueous	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
			Unpres	Aqueous	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
			Unpres	Aqueous	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Relinquished By *	Date/Time	Received By	Date/Time
Steve Mailander	10-16-12 16:00	R. Schmidt	10/17/12 8:38
R. Schmidt	10/17/12 10:00		10-17-12 1000

* The individual signing this agreement on behalf of client acknowledges that they have read and understand the terms of this agreement and that they have the authority to sign on behalf of client.